

**Fusion3**

# **EDGE 3D Printer**

## **CONSUMABLE ITEMS**

**Revision 5/28/2022**

# EDGE 3D PRINTER: CONSUMABLE ITEMS

In regards to the Fusion3 EDGE 3D printer, the following items are considered consumables:

- ANVIL print head tubes
- ANVIL print head heater cartridges
- ANVIL print head temperature sensors
- Glass print surfaces
- Print surfaces used with the Magnetic print bed
- Bowden tubes
- Print chamber filter elements (HEPA+carbon)
- Print head scrub pads

These items are not expected to last the life of the printer and are not covered under the machine's 2 year warranty.

Many of these items have a defined replacement schedule and maintenance reminders built into system interface of your EDGE 3D printer. When an item is due for replacement, you will see a notification on the screen.

## ANVIL PRINT HEAD TUBES

The core of the ANVIL print head is a disposable easily-replaced thin-wall tube. The print head is designed so that in the event of a print head jam, or poor print performance, you can remove the tube, throw it away, and install a new one.

### When To Replace

- Not replaced on a maintenance schedule
- Replace if jammed and you cannot recover it
- Replace if printing performance degrades



**For More Information, please refer to the Documentation Module, “ANVIL - Changing Print Head Tubes”**

## ANVIL PRINT HEAD HEATER CARTRIDGES

ANVIL print head heater cartridges are a 24VDC 65W heater for EDGE. While heater cartridges are simple devices and are fairly robust, the environment they live in is a hostile one. So we don't expect them to last the 2 year warranty period.

### When To Replace

- Not replaced on a regular maintenance schedule. If you wish to replace prophylactically, consider replacing once a year in high-use environments.
- Replace if you and/or Fusion3 Customer Support team determine there is a problem with the component.
- Replace if the component becomes too covered in debris or melted filament to be easily/precisely installed & removed from the ANVIL print head.

**For More Information, please refer to the Documentation Module, "ANVIL - About the ANVIL Print Head"**



## ANVIL PRINT HEAD TEMPERATURE SENSORS

The temperature sensor in ANVIL print heads is a PT1000, which is more reliable than a simple thermistor. That said, we still don't expect a sensor to last 2 years.

Unlike thermistors, PT1000 sensors have an easily-detected and fairly binary failure mode: they work, or they don't. (Thermistors can exhibit a period of degraded performance where they "work" but don't report the correct temperatures.) Therefore, it's **not** necessary to replace these sensors on a schedule or as a preventative maintenance item.



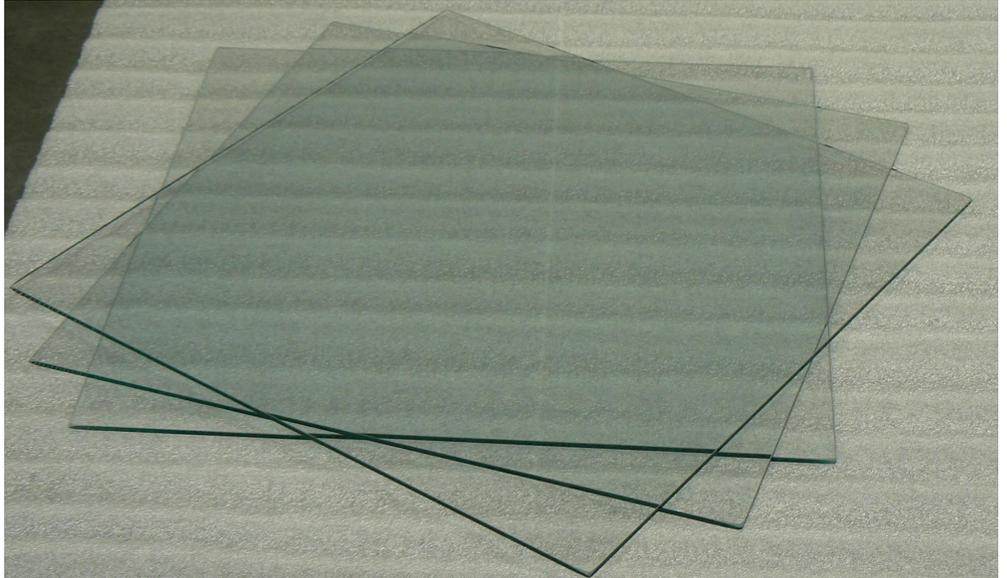
### When To Replace

- Not replaced on a maintenance schedule. If you wish to replace prophylactically, consider replacing once a year in high-use environments.
- Replace if you and/or Fusion3 Customer Support team determine the sensor is faulty.
- Replace if the component becomes too covered in debris or melted filament to be easily/precisely installed & removed from the ANVIL print head.

**For More Information, please refer to the Documentation Module, “ANVIL - About the ANVIL Print Head”**

## **GLASS PRINT SURFACES**

Much like our current products, the glass print surfaces on EDGE are not indestructible. With correct use and bed prep, they can last a year or more. But sometimes they break even if you do everything right.



Like other consumables, our philosophy focuses on making the replacement parts low cost and for you to replace, vs trying to engineer an indestructible component.

EDGE glass print surfaces can also be used on both sides. So if you damage one side, simply turn it over and keep printing.

Glass panels purchased from Fusion3 have deburred edges to remove the risk of being cut on the knife-sharp edge of the panel.

### **When To Replace**

- Not replaced on a maintenance schedule
- Replace if chipped / divots pulled out on both sides
- Replace if cracked through
- Replace if damaged in a way that makes a sharp edge that could be hazardous to the user

**For More Information, please refer to the Documentation Module, “EDGE - Replacing a Print Bed - Glass”**

## PRINT SURFACES USED WITH THE MAGNETIC PRINT BED

The Magnetic Print Bed is comprised of two components:

- The thin steel sheet
- The actual print surface that's laminated to the steel sheet

Both of these components are considered consumable items.

### When To Replace

- Not replaced on a maintenance schedule.
- If the steel sheet becomes permanently bent, creased, warped, etc. If it won't lie flat on a desk, please replace.
- If the print surface starts to delaminate or pull away from the steel sheet (adhesive failure).
- If the print surface becomes excessively scored, scratched, or damaged in a way that prevents reliable print adhesion.



**For More Information, please refer to the Documentation Module, "EDGE - Replacing a Magnetic Print Bed Surface"**

## BOWDEN TUBES

On EDGE the bowden tube is retained with push-to-connect (PTC) fittings on both ends.

Benefits:

- It's fast and easy to disconnect a bowden tube for maintenance, replacement, or troubleshooting.
- The tube is a low-cost, easily-replaced component.

Drawbacks:

- The tube must be replaced more often than on other Fusion3 products.
- Printing performance can degrade if the tube is not replaced when required.



## **When To Replace:**

- Replaced on a maintenance schedule - notification will appear when due for replacement.
- If you remove 1 or both ends from a PTC fitting for any reason. DO NOT reuse a bowden tube once it has been inserted into a PTC fitting for any reason.
- You observe poor print quality (stringing, flow starvation, retraction issues). You observe the tube can move back-and-forth in the PTC fitting more than 0.25mm with light force.
- The tube becomes warped, deformed, droopy, etc.

## **FAQ:**

### **Your replacement schedule seems overly aggressive. What happens if I don't replace the tube on schedule? Will my warranty be voided?**

Your warranty will stay in force. You are welcome to ignore or extend the replacement interval on bowden tubes as long as you like, and as long as you achieve satisfactory print quality for your application. However, if you contact Fusion3 Support for assistance the first thing we're going to ask you to do is catch up on deferred maintenance, such as replacing your bowden tube. This is also our first step to debug any print quality issues you're experiencing.

### **Can't I just trim the end of the tube to make the PTC fittings engage in a different spot?**

Fusion3 does not *officially* recommend this. However, yes for our advanced users this is possible, and can be used to extend the useful life of a bowden tube. DO NOT remove more than 0.5" of total length from the tube, or it will be too short to reach the full travel of the print head. Make sure you trim the ends correctly (see "See Also" section below). As with deferring tube replacement, if you reach out to our Support team the first thing we're doing to do is ask you to do is replace the tube with a fresh one that's the correct length.

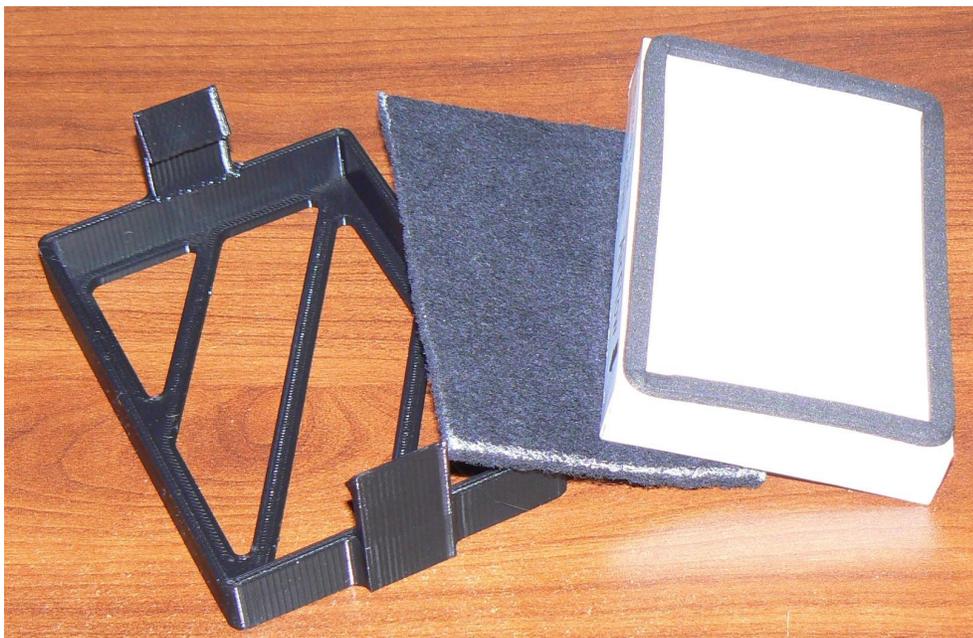
**For More Information, please refer to the Documentation Module, "EDGE - Maintenance - Replacing a Bowden Tube"**

## PRINT CHAMBER FILTER

The HEPA and carbon filter elements must be replaced regularly to maintain correct performance and effective filtration of the exhaust air from the print chamber.

### When To Replace:

- Replaced on a maintenance schedule - notification will appear when due for replacement



### FAQ:

**Your replacement schedule seems overly aggressive. What happens if I don't replace the filter elements on schedule? Will my warranty be voided?**

Failure to replace the filter elements on schedule may adversely impact the filter's ability to clear particulates from the exhaust stream, causing additional odors and a reduction in your expected benefits of using filters to reduce the impacts of emissions from different materials printed. As always, please review the safety data sheets of any materials you choose to print and take appropriate precautions before printing.

Failure to replace the filter elements on schedule may cause a reduction in airflow in your Fusion3 3D printer which in turn could cause damage to your Fusion3 3D printer which may not be covered under your 2 year Fusion3 Limited Warranty.

**For More Information, please refer to the Documentation Module, "EDGE - Maintenance - Replacing Filter Elements"**

## PRINT HEAD SCRUB PADS

The print head scrub pad is used to clean the tip of the print head nozzle during the probe offset calibration procedure. It must be relatively clean and fresh in order to do its job effectively.



### When To Replace:

- Replace on a maintenance schedule - notification will appear when due for replacement
- Replace if you notice excessive debris in the pad.
- Replace if the scrub pad is no longer effectively cleaning the print head during the start-of-print sequence. You may see notifications about probe failures, and/or your first layer height will not be correct.

### FAQ:

**Your replacement schedule seems overly aggressive. What happens if I don't replace the scrub pad on schedule? Will my warranty be voided?**

In most cases, deferring scrub pad replacement will not cause a warranty issue. However, this is not a blanket statement. If it's determined that proper maintenance of the scrub pad was overlooked and contributed to 3D printer damage, which may not be covered under your Fusion3 2 Year Limited Warranty.

If your nozzle offset calibration process is working fine, then it's probably fine to extend the life or defer replacing the scrub pad on schedule. Especially if you are doing fewer long prints vs many short prints, the replacement schedule may not be a good fit for your application. As with bowden tube replacement, Fusion3 Support will ask you to catch up on deferred maintenance (such as scrub pad replacement) at the first sign of issues.

**For More Information, please refer to the Documentation Module, "EDGE - Maintenance - Replacing a Print Head Scrub Pad"**